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ZOOLOGY.

Locomotion of Limpets.—Herdman records¹ several facts which seem to militate against the view that limpets do leave their resting place and return to it again. It has been shown that they can leave and travel some distance, but he found a specimen of *Patella vulgata* which was sticking to a cylindrical bar of iron and which had the shell molded to fit the surface. Now as the bar was short and free to move about, the probabilities are that if it once left the support it would never be able to return to it. In other cases he found limpets at the bottom of deep pits, from which it would be very difficult, if possible at all, for them to extricate themselves.

Tunicate Studies.—Herdman publishes² some notes on the structure of the Appendicularian, *Ekopleura*. This form was studied by serial sections, and the results, most interesting, are: The condition of the endostyle as a diverticulum to a great extent shut off from the branchial sac; the presence of a genital duct; the distribution of the enlarged ectoderm cells and the cuticular test; the exact course of the nerve cord through the posterior part of the body; and the shapes and positions of the alimentary and reproductive viscera.

In the same publication³ Garstang points out that *Appendicularia mossii* (*Mossia dolioides*) is to be regarded as a member of the genus *Kowalevskia* of Fol, and that it in reality has not that importance from the phylogenetic standpoint which was attributed to it by Herdman in his "Challenger" report.

The Skeleton and Teeth of the Australian Dugong.—Zoologists are indebted to Prof. G. B. Howes and Mr. J. Harrison for a valuable paper on the skeleton and teeth of the Australian Dugong, of which the following is an abstract:

"The authors showed that the vertebral epiphyses are more fully developed than Albrecht has suspected, and that they appear late and rapidly ankylose with the centra, a feature of especial interest, in view of Lefèvre's alleged discovery of fully developed epiphyses in *Halietherium schinzii* and *Metaxytherium*. On comparison with the Cetacea

¹Trans. Liverpool Biol. Soc., vi, 22, 1892.

²Trans. Liverpool Biol. Soc., vi, 40, 1892.

³L. C., p. 57, 1892.

they sought to associate the reduction of the epiphyses with adaptation to an aquatic existence.

"In dealing with the limb-skeleton they described a longitudinal cleavage of the phalanges, akin to that recorded by Kükenthal for the Cetacea. The only structures observed which were at all comparable to supernumerary phalanges were derivations of the terminal (ungual) ones, arising proximally; and the observations lend no support to Kükenthal's view that supernumerary phalanges are epiphysial in origin.

"The first upper incisor and the four lower ones of either side were shown to have milk predecessors, which are early absorbed. Five teeth were shown to be present on either side of the symphyseal region of each mandibular ramus of *Manatus*, the fifth one being claimed as a canine; and in this animal the authors described milk predecessors to the two anterior pairs of mandibular cheek teeth."

On the Cephalo-humeral Muscle and the So-Called Clavicle of Carnivora.—At a meeting of the Philadelphia Academy, Dr. Harrison Allen spoke of the peculiarities of the cephalo-humeral muscle in mammals and invited especial attention to the presence of a small fibro-cartilaginous disc in the junction of the cephalo-humeral with the muscles which are inserted in the bones at the region of the shoulder. This is well defined in *Felis* and is identified as a rudimental clavicle. Dr. Allen has detected this structure in *Herpestes*, *Taxidea*, *Cercoleptes*, *Bassaris*, and *Procyon*.

The cartilage is either in the form of a flat disc or a minute scythe-shaped rod, and is constant in lying directly over the greatest convexity formed by the round of the shoulder. It seems to give strength to the center of a muscle system of which the cephalic, cervical, pectoral and latissimal sheets are parts. The identification of such a plate or rod with a true clavicle is doubtful, since in *Balantiopteryx* (a genus of bats) the structure above described is remarkably developed, while the clavicle is as well formed as in any other animal. The long rod-like body is continuous with a fascicle of fibres arising from the pectoralis and receives the insertion of the occipito-pollicalis. The anterior end of the rod lies in the upper border of the wing membrane and is continuous with the fibrous thread which represents the tendon of the occipito-pollicalis as this muscle is defined in the bats generally. From both the proximal and distal divisions of this muscle delicate fascicles pass toward the elbow and the entire plan appears to be associated with the rudiment of the characteristic skin sac. Slight modification of this arrangement is met with in the allied genus *Rhynchonycteris*.

Comparison of this arrangement with that seen in the common brown bat (*Adelonycteris fuscus*), the noctula bat (*Noctulinia noctula*), and the false vampire (*Vampyrus spectrum*) showed by the part taken by the rod in *Balantiopteryx* is the tendon of a pectoral muscle-fascicle which is inserted into the occipito-pollical muscle as it crosses the shoulder, while in the group of the Molossi the muscle-fascicle is fleshy throughout its entire extent, but on the whole preserving the same relations. Thus the fibro-cartilage of *Balantiopteryx* is represented by fibrous tissue in *Adelonycteris* and both these in turn by muscle in the Molossi. Dr. Allen believed that it was inexact to speak of a clavicle and of this rod as things which were equal. The clavicle acts with the scapula in supporting the head of the humerus but in no wise limiting or determining its movements, while the rod is always over the outer aspect of the shaft of the humerus below its head and acts as a check to abduction of this bone.—Proceeds. Phila. Acad., Pt. 2, 1892.

A New Synaptomys from New Jersey.—While trapping for a type series of the new race of *Evotomys* described by Mr. Stone in the present number of THE NATURALIST, I had the fortune to secure a specimen of this long-looked-for genus, which is, I believe, the first taken in flesh east of the Alleghany Mountains.

It had previously been detected by the U. S. Department of Agriculture in the rejects of a barn-owl living in the tower of the Smithsonian Institution.

A comparison of the New Jersey specimen with two *Synaptomys cooperii* from Ohio, courteously loaned by Mr. J. A. Allen, of the American Museum of Natural History, N. Y., shows such marked specific differences that it will be unnecessary to more than briefly allude to them.

SYNAPTOMYS STONEI.—Sp. nov. Type No. 567. ad. ♀. coll. S. N. Rhoads, May's Landing, N. J. Dec. 2, 1892.

Special Characters.—Outward appearance and proportions as in *S. cooperii*. Above blackish-brown, with black hairs more predominant over the shorter brown hairs than in *cooperii*. The same color reaching around sides of belly instead of being confined to dorsal area as in *cooperii*. Hoary gray belly and neck of *cooperii* replaced by dark plumbeous gray. Feet, including soles, plumbeous, without brown shade. Two middle toes of fore-feet and four inner toes of hind feet, including nails, white. Tail unicolor plumbeous gray. Lips encircled with narrow white edgings.

Skull narrower, shallower, and, viewed from above, less angular than that of *cooperii*, but of same length. Lower jaws viewed from below, ditto. Incisors shorter, broader, and less cylindrical, with sulcation of upper pair much more distinct. Zygomatic foramen longer and narrower. Sagittal suture and parietals relatively much longer; interparietal transversely narrower, longitudinally longer. Supra-occipital in *cooperii* twice as wide as deep, in *stonei* thrice as wide as deep.

Molars one-third wider and one-eighth longer in *stonei*. In *cooperii* the length of the symphysis mandibuli just equals the distance from its posterior end to the angle formed by the antero-inferior border of the masseteric fossa; in *stonei* the symphysis is one-third longer.

Posterior face of angle of lower jaw in *stonei* very stout, abruptly rounded, and recurved outward; in *cooperii* it is slender, spatulate, elongated posteriorly in a nearly vertical plane, and the margin below the condyle not thickened as in the former species.

Measurements in millimeters of the New Jersey specimen in the flesh, with averages of six alcoholic specimens of *cooperii*, made by Dr. Coues, are given :

	Full length.	Tail.	Foot.	Ear.
<i>Synaptomys cooperii</i>	105	18	18	8
<i>Synaptomys stonei</i>	117	18	18	9

The age of specimens on which the above cranial and color characters are based is evidently about the same. In other respects they may be safely considered normal adult representatives of the species in the different localities where they were taken. The new species may fittingly bear the name of my friend and collaborer, Mr. Witmer Stone, Curator of Birds in the Philadelphia Academy of Natural Sciences.

SAMUEL N. RHOADS.

A New *Evotomys* from Southern New Jersey.—On October 25, 1892, while collecting small mammals near May's Landing, New Jersey, in company with Mr. S. N. Rhoads, I captured a specimen of *Evotomys*, a genus which has not previously been reported from south of Massachusetts and the Adirondacks, except in the higher mountains of North Carolina. The next day three more specimens were secured, and subsequently (December 2) Mr. Rhoads collected four others in the same locality. A comparison of these specimens with a series of *Evotomys gapperii* from Northern New York, which is apparently the most closely related form, shows them to be subspecifically distinct,

and I therefore propose for the New Jersey animal the name *Evotomys gapperi rhoadsii* in honor of my friend, Mr. Samuel N. Rhoads.

The comparison of a series of skulls of *E. gapperi* and *E. g. rhoadsii* fails to show any constant differential characters, though the immature specimens of the new race are peculiar in the structure of the last upper molars. In these teeth the first reentrant angle on the inside is opposite the second salient angle on the outside instead of the first reentrant angle as is the case in the adults of both forms. One young specimen of *E. gapperi* shows a tendency to this structure, but in all the other specimens that I have examined the reentrant angles meet, and the outer one is deflected posteriorly.

In proportions the New Jersey race seems to average rather smaller than *E. gapperi* from the Adirondacks, while the tail is shorter and the feet slightly longer than in that species.

As regards coloration *E. g. rhoadsii* is everywhere darker than *E. gapperi*, and has a plumbeous cast on the sides and flanks, while it lacks almost entirely the buff suffusion generally seen on the sides and under surface of the latter species.

Above the color is decidedly darker than in *E. gapperi*, and there are a great many more black hairs scattered over the back. The reddish area is not so well defined and the color is darker—more of a mahogany shade. The tail is distinctly bicolor, but the upper surface is darker than in *E. gapperi*, and the feet have a decidedly gray suffusion, contrasting strongly with the pure white of the latter species.

Some immature specimens of *E. gapperi* approach adult *E. g. rhoadsii* in general coloration, but the young of the latter race with which they should properly be compared have scarcely a trace of the reddish dorsal area, the middle of the back being brownish and the sides gray. The table on next page, will show the comparative measurements of the two forms, the specimens of *E. gapperi* being selected from a series kindly loaned me by Mr. G. S. Miller.

Dr. C. Hart Merriam, of the Department of Agriculture, Washington, D. C., has kindly examined my New Jersey material and compared it with *Evotomys carolinensis* and other species to which I had not access, but its closest relationship appears to be with *E. gapperi*. All the specimens of this new mouse so far secured were taken in a cranberry bog on the Egg Harbor River, about a mile above the town of May's Landing, N. J. The unexpected occurrence of this boreal genus well within the Carolinian Fauna may probably be accounted for by the theory already advanced by Dr. Merriam that in these damp bogs, where the temperature is much lower than in the surrounding dry

Evotomys gapperii.

No.	Sex.	Locality.	Date.	Length.	Tail Vertebrae.	Hind Foot.
1570 1567	♂	Peterboro, N. Y.	July 17, 1892	151 mm.	41 mm.	17 mm.
1577 1574	♀	" "	July 19, 1892	165	51	18.4
1637 1434	♀	" "	Aug. 1, 1892	160	46	19.6
1340 1158	♂	Keene Valley, N. Y.	Mar. 17, 1892	155	45	20
Average.....				158	46	19

Evotomys gapperii rhoadsii.

No.	Sex.	Locality.	Date.	Length.	Tail Vertebrae.	Hind Foot.
160	♂	Type, Coll. of W. Stone.	Dec. 2, 1892.	142	40	20
161	♀	" "	" "	130	37	20
570	♀	Coll. of S. N. Rhoads.	" "	123	34	21
571	♂	" "	" "	130	36	20
Average.....				131	37	20

areas, the conditions of life are quite suited to more boreal species, especially animals of nocturnal habits. The presence of various Ericaceous and other boreal types of plant life in these locations also supports this hypothesis.—WITMER STONE, Academy of Natural Sciences, Philadelphia.

Zoological News.—VERTEBRATA.—Some new reptiles and fishes from Australia are described by J. Douglas Ogilby. The list comprises *Typhlops curtus* from the Gulf of Carpentaria, *Hoplocephalus suboccipitalis* from Morel, and *Clupea sprattelloides* from rivers flowing into Port Jackson and Botany Bay. The latter species has until now been supposed to be the young of *C. novæ-hollandiæ*.—Records Austr. Mus., Vol. ii, No. 2.—F. W. True reports that the collection of African mammals presented to the National Museum by Dr. Abbott contains several species apparently new: *Dendrohyrax validus*, *Mus aquilus*, *Dendromys nigrifrons*, *Sciurus undulatus*, *Cephalophus spadix*. The known range of several species is considerably extended by Dr. Abbott's labors. The mammalian fauna of the Kilima-Njaro region as indicated by this collection includes seventy-one to seventy-three species.—Proceeds. U. S. Natl. Mus., Vol. xv, pp. 445-480.